

WHAT IS CLAIMED IS:

1. A laser oscillating apparatus for exciting a laser gas by an electromagnetic wave and resonating generated plasma light so as to generate laser light,

wherein a light emission portion of said plasma light is a slit-shaped gap formed along a lengthwise direction of a plate member provided above and away from an electromagnetic-wave emission source.

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2. The laser oscillating apparatus according to claim 1, further comprising a shielding structure having a shielding wall covering said electromagnetic-wave emission source,

wherein said shielding structure is internally supplied with said laser gas,

and wherein an upper surface of said shielding structure is used as said plate member, and said gap is formed along the lengthwise direction of said plate

20 member.

3. The laser oscillating apparatus according to claim 2, wherein said shielding structure comprises a pair of chambers communicating with each other via said gap.

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4. The laser oscillating apparatus according to claim

0 3, wherein said electromagnetic-wave emission source is provided in each of said chambers.

0 5. The laser oscillating apparatus according to claim
5 1, wherein a waveguide comprising a pair of chambers internally supplied with laser gas is provided above and below said plate member via said gap,

and wherein said electromagnetic wave is generated in one of said chambers and is propagated to the other
10 one of said chambers through said gap, to continuously cause said plasma light over the entire area along the lengthwise direction where said gap is formed.

0 6. The laser oscillating apparatus according to claim
15 5, wherein an end of one of said pair of chambers is shifted to that of the other one of said chambers by a predetermined distance.

0 7. The laser oscillating apparatus according to claim
20 1, wherein an opening of said electromagnetic-wave emission source is wider than said slit-shaped gap provided above said opening.

A 8. A laser oscillating apparatus for exciting a laser
25 gas by an electromagnetic wave and resonating generated plasma light so as to generate laser light, comprising

awaveguide comprising a pair of chambers each internally
supplied with said laser gas,

wherein said waveguide has a slit-shaped gap in a
lengthwise direction, and said chambers communicate with
5 each other via said gap,

and wherein said electromagnetic wave is generated
in one of said chambers and is propagated to the other
one of said chambers through said gap, to continuously
cause said plasma light over the entire area along the
10 lengthwise direction where said gap is formed.

11/2 9. The laser oscillating apparatus according to claim
8, wherein an end of one of said pair of chambers is
shifted to that of the other one of said chambers by a
15 predetermined distance.

10. The laser oscillating apparatus according to claim
1, said laser gas is supplied in a flow direction
orthogonal to a generation direction of said laser light
20 and across said gap.

11. The laser oscillating apparatus according to claim
8, said laser gas is supplied in a flow direction
orthogonal to a generation direction of said laser light
25 and across said gap.

12. The laser oscillating apparatus according to claim
1, wherein said electromagnetic wave is a microwave.

13. The laser oscillating apparatus according to claim
5 8, wherein said electromagnetic wave is a microwave.

14. The laser oscillating apparatus according to claim
1, wherein said laser gas is at least one inert gas
selected from Kr, Ar Ne and He or a gaseous mixture of
10 said at least one inert gas and an F₂ gas.

15. The laser oscillating apparatus according to claim
8, wherein said laser gas is at least one inert gas
selected from Kr, Ar Ne and He or a gaseous mixture of
15 said at least one inert gas and an F₂ gas.

16. An exposure apparatus comprising:
the laser oscillating apparatus according to claim
1 as a light source that emits illumination light;
20 a first optical unit that irradiates a reticle,
where a predetermined pattern is formed, with the
illumination light from said laser oscillating
apparatus; and
a second optical unit that irradiates an
25 irradiated surface with the illumination light via said
reticle,

wherein said predetermined pattern on said reticle is projected on said irradiated surface upon exposure of said irradiated surface.

5 17. A device fabrication method comprising:

a step of applying a photosensitive material to an irradiated surface;

10 a step of exposing said irradiated surface coated with said photosensitive material via a predetermined pattern by using the exposure apparatus according to claim 16; and

a step of developing said photosensitive material exposed via said predetermined pattern.

15 18. The device fabrication method according to claim 17, wherein said irradiated surface is a wafer surface, and wherein a semiconductor device is formed on said wafer surface.

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